

REMARKS

Claims 1-20 are now present in this application.

The specification and claims 1, 3, 8, 9, 10, 11, 12, 17, 18, 19 and 20 have been amended. Reconsideration of the application, as amended, is respectfully requested.

The drawings stand objected to under 37 CFR 1.83(a). Accordingly, attached hereto is a Letter to the Official Draftsperson in which it is proposed that Fig. 1 be labeled --Prior Art--, and in which it is proposed that various corrections be made to Figs. 2(a), 2(b), 3, and 5. Accordingly, reconsideration and withdrawal of any objection to the drawings are respectfully requested.

The specification and claims stand objected to for certain informalities. In view of the foregoing amendments, it is respectfully submitted that these informalities have been addressed. Reconsideration and withdrawal of any objection to the specification are therefore respectfully requested.

Claims 1-20 stand rejected under 35 USC 112, second paragraph. This rejection is respectfully traversed.

In view of the foregoing amendments, it is respectfully submitted that the claims particularly point out and distinctly claim the subject matter of the instant invention. Accordingly, reconsideration and withdrawal of the 35 USC 112, second paragraph rejection are respectfully requested.

Claims 1-8, 10-17 and 19-20 stand rejected under 35 USC 103 as being unpatentable over CHEN, U.S. Patent 5,945,765 in view of MIYAZAWA et al., U.S. Patent 6,166,470. This rejection is respectfully traversed.

Claims 9 and 18 stand rejected under 35 USC 103 as being unpatentable over CHEN and MIYAZAWA et al., and further in view of HASEBE, U.S. Patent 4,899,075. This rejection is respectfully traversed.

The objects of the present invention are to provide a miniature motor structure omitting the prior bearing tube to reduce cost and simplify the required fabricating process. Referring to Figs. 2a and 2b of the present invention, each of the second outer teeth 220 interposed between the first outer teeth 120, and each of the second inner teeth 210 interposed between the first inner teeth 110 for providing continuous and closed magnetic conduction. Additionally, the conventional bearing tube can be omitted.

In contrast, CHEN teaches an interior stator assembly having a coil assembly 3 and two silicon plates 4, 5. Each of the silicon plates 4, 5 have three magnetically existing sheets 45, 55 and inner insert sheets 43, 53. However, the inner insert sheets 43, 53 of the silicon plates 4, 5 are inserted into the coil assembly 3 passing through the grooves 311, 321, rather than not interposed between each other (see CHEN, col. 2, lines 10-21 and Figs. 3-4, for example). Furthermore, three magnetically existing sheets 45,

55 are not interposed between each other. The inner insert sheets 43,53 of the silicon plate are not interposed between each other, such that this structure can not minimize the volume of motor and will cause the discontinuous magnetic conduction and the magnetic loss (see Fig. 3 of CHEN, for example). Thus, none of the references, when taken alone or in combination, teaches or suggests that "each of the second inner teeth 210 interposed between the first inner teeth 110" or "each of the second outer teeth 220 interposed between the first outer teeth 120." The secondary references used by the Examiner fail to overcome the above-noted deficiencies of the primary reference.

In view of the foregoing amendments and remarks, it is respectfully submitted that the miniature motor structure disclosed in independent claims 1 and 12, as well as their dependent claims, is neither taught nor suggested by the prior art utilized by the Examiner. Accordingly, reconsideration and withdrawal of all objections and rejections are respectfully requested.

Favorable reconsideration and an early Notice of Allowance are earnestly solicited.

Because the additional prior art cited by the Examiner has been included merely to show the state of the prior art and has not been utilized to reject the claims, no further comments concerning this document are considered necessary at this time.

In the event that any outstanding matters remain in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning on page 1, line 13, has been amended as follows:

--As shown in Fig.1, the stator structure of a conventional miniature motor includes an upper silicon steel 10, a bearing tube 20, a lower silicon steel 30 and a coil 40. Among these, the upper silicon steel 10 and the lower silicon steel 30 are annular in shape. Besides, there are upper side plates [502] or lower side plates [512] extending upward or downward from the outer periphery of the upper silicon steel 10 and the lower silicon steel 30. The cylindrical bearing tube 20 provides a rivet joint so as to joint the upper silicon steel 10, the coil 40 and the lower silicon steel 30 together. Further, the coil 40 is sandwiched between the upper silicon steel 10 and the lower silicon steel 30.--

The paragraph beginning on page 2, line 8, has been amended as follows:

--The present miniature motor structure includes a first coil seat, second coil seat, a coil, a circular magnet, a metal housing and a shaft. The first coil seat includes a first bottom plate, a plurality of first outer teeth and a plurality of first inner teeth. The first bottom plate further includes a first central opening. The first outer teeth protrude [form] from the first bottom plate and surround the outer periphery of the first bottom plate. The first inner teeth protrude [form] from the first bottom plate and surround the first central opening. Further, the coil is positioned in the first coil seat.--

The paragraph beginning on page 2, line 19, has been amended as follows:

--The second coil seat includes a second bottom plate, a plurality of second outer teeth and a plurality of second inner teeth. The second bottom plate further includes a second central opening. The second outer teeth protrude [form]from the second bottom plate and surround the outer periphery of the second bottom plate. The second inner teeth protrude [form]from the second bottom plate and surround the second central opening. --

The paragraph beginning on page 4, lines 27, has been amended as follows:

--[Fig.5] Figs. 5a-5b depict[s another] two preferred embodiments according to the present invention.--

The paragraph beginning on page 7, line 30, has been amended as follows:

--[Another] Two preferred embodiments of the present invention [is] are shown in [Fig.5]Figs. 5a-5b. In the first coil seat or the second coil seat, the number of the outer teeth may be different from or the same with the number of the inner teeth. For example, the first coil seat 100 shown in [Fig.5]Figs. 5a-5b includes four first outer teeth 120 and three first inner teeth 130. In the first coil seat 100 shown in Fig.2(a), the number of the first outer teeth 120 is the same with the number of the first inner teeth 130. Besides, in order to advantageously adjust the angle of magnetic inclination to start the motor, the inner teeth or the outer teeth optionally includes a cut corner 170,180 an arc [174]172,182 and a gap 176,186 [may] extending from the outer teeth to the bottom plate.--

The paragraph beginning on page 8, line 13, has been amended as follows:

--According to the present invention, the first coil seat and the second coil seat are coupled to each other by [self-inner] interlaced teeth so that the prior bearing tube, such as the element 20 shown in Fig.1, can be omitted. Therefore, the present invention simplifies the manufacturing process and thus reduces cost.--

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) A miniature motor structure, comprising:
 - a stator, further comprising:
 - a first coil seat, including a first bottom plate, a plurality of first outer teeth, a plurality of first inner teeth;
 - a coil, formed in the first coil seat;
 - a second coil seat, including a second bottom plate, a plurality of second outer teeth, a plurality of second inner teeth, said second coil seat [formed] disposed on the first coil seat, each of said second outer teeth interposed between said adjacent first outer teeth, each of said second inner teeth interposed between said adjacent first inner teeth;
 - a circular magnet, surrounding said stator; and
 - a [shift]shaft, [coupled to] passing through said stator.

2. (Amended) The miniature motor structure according to claim 1, wherein said first bottom plate further includes a first central opening, said first outer teeth protruding [form]from said first bottom plate and surrounding an outer periphery of said first bottom plate, said first inner teeth protruding [form]from said first bottom plate and surrounding said first central opening.

3. (Amended) The miniature motor structure according to claim 1, wherein said second bottom plate further includes a second central opening, said second outer teeth protruding [form]from said second bottom plate and surrounding an outer periphery of said second bottom plate, said second inner teeth protruding [form]from said second bottom plate and surrounding said second central opening.

8. (Amended) The miniature motor structure according to claim 1, wherein said first coil seat and said second coil seat are assembled with said coil [is] wound around [a post consisting of] said first coil seat and said second coil seat.

9. (Amended) The miniature motor structure according to claim 1, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise a cut corner.

10. (Amended) The miniature motor structure according to claim 1, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise an arc.

11. (Amended) The miniature motor structure according to claim 1, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise a gap.

12. (Amended) A miniature motor structure, comprising:
a stator, further comprising;
a first coil seat, including a first bottom plate, a plurality of first outer teeth, a plurality of first inner teeth, said first

bottom plate further including a first central opening, said first outer teeth protruding [form]from said first bottom plate and surrounding an outer periphery of said first bottom plate, said first inner teeth protruding [form]from said first bottom plate and surrounding said first central opening;

a coil, formed in the first coil seat;

a second coil seat, including a second bottom plate, a plurality of second outer teeth, a plurality of second inner teeth, said second coil seat [formed] disposed on the first coil seat, said second bottom plate further including a second central opening, said second outer teeth protruding [form]from said second bottom plate and surrounding an outer periphery of said second bottom plate, said second inner teeth protruding [form]from said second bottom plate and surrounding said second central opening, each of said second outer teeth interposed between said adjacent first outer teeth, each of said second inner teeth interposed between said adjacent first inner teeth;

a circular magnet, surrounding said stator;

a metal housing, surrounding said circular magnet; and

a [shift]shaft, [coupled to] passing through said stator.

17. (Amended) The miniature motor structure according to claim 12, wherein said first coil seat and said second coil seat are assembled with said coil [is] wound around [a post consisting of] said first coil seat and said second coil seat.

18. (Amended) The miniature motor structure according to claim 12, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise a cut corner.

19. (Amended) The miniature motor structure according to claim 1, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise an arc.

20. (Amended) The miniature motor structure according to claim 1, wherein said first outer teeth and said second outer teeth, or said first inner teeth and said second inner teeth further comprise a gap.